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CARLSON, GASKEY & OLDS, P.C.
400 WEST MAPLE ROAD
SUITE 350
BIRMINGHAM, MI 48009

EXAMINER	
GLASS, ERICK DAVID	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/816,092
Filing Date: April 01, 2004
Appellant(s): MARKS ET AL.

Kenneth Marks
For Appellant

EXAMINER'S ANSWER

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,553,770	TISDALE ET AL	4-2003
6,771,032	COX-SMITH ET AL	8-2004
5,876,370	BLOMQUIST	3-1999
6,933,698	MIURA ET AL.	8-2005
5,638,387	PALLEGGI ET AL.	6-1997
5,619,111	KATAGIRI ET AL.	4-1997
6,731,089	CHO ET AL.	5-2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cho et al. (6,731,089) in view of Miura et al. (6,933,698).

With respect to claim 1, Cho et al. disclose a controller for controlling a plurality of motors in a fluid handling system (CAN is used in automobile systems, which handle fluid, e.g. fuel, air, etc.), comprising; a connector input/output port that communicates with at least one sensor in the fluid handling system to obtain sensor data (Fig. 1, encoder is the sensor and is input into 'B' at the 'Encoder Input'); at least one digital signal processor (DSP) (Fig. 1, #10) and gate driver (Fig. 1, J1) interface that evaluates the sensor data and generates a control signal based on the sensor data (Fig. 1, #10 evaluates encoder signal and sends PWM control signal; see Fig. 4)); and at least one commutation module in communication with the at least one DSP and gate driver interface, wherein said at least one communication module controls at least one motor based on the control signal (Fig. 1 , #34); said at least one motor receiving AC power under normal conditions.

Cho et al. does not disclose the power supplies that operate as recited in claim 1. Miura et al. discloses a CAN system that implements a local power supply that selectively powers the motors (Fig. 1, #15, note that "local" is a relative term), and the

local power supply is a backup power supply is used to drive the motors (col. 2, lines 40-53). The motivation to use a backup power supply is to keep the system operating in the event of a power failure from the main power supply.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to implement into the CAN system of Cho et al., a backup power supply that allows the DSP and gate drivers to continue to drive the motors in the event that there is a main power failure, as taught by Miura et al.

With respect to claim 4, Cho et al. teaches wherein at least one of said plurality of motors shares one DSP (fig.1, 10) and gate driver (fig. 1, J1) interface and one motor commutation module.

Cho et al. does not disclose the power supplies that operate as recited in claim 7 and 8.

Miura et al. discloses a CAN system that implements a local power supply that selectively powers the motors (Fig. 1, #15, note that "local" is a relative term), and the local power supply is a backup power supply is used to drive the motors (col. 2, lines 40-53). The motivation to use a backup power supply is to keep the system operating in the event of a power failure from the main power supply.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to implement into the CAN system of Cho et al., a backup power supply that allows the DSP and gate drivers to continue to drive the motors in the event that there is a main power failure, as taught by Miura et al.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Palleggi et al. (5,638,387) in view of Blomquist (5,876,374).

With respect to claim 1, Palleggi et al disclose a controller for controlling a plurality of motors in a system, comprising: a connector port that communicates with at least one sensor to obtain sensor data (Fig. 8, input from encoders #s 30 and 31); at least one microprocessor, which is interpreted as a DSP, and gate driver interface that evaluates the sensor data and generates a control signal based on the sensor data (Fig. 8, #s 53 and 54 evaluate data from encoders #s 30 and 31); and at least one commutation module in communication with at least one DSP and gate driver interface, wherein the at least one commutation module controls at least one motor based on the control signal (Fig. 8, #s 57 and 58); said at least one motor receiving AC power under normal conditions.

Palleggi et al. does not disclose the local power supply limitations of claim 1.

Blomquist discloses a motor control system that implements a local power supply that selectively powers the motors, and the local power supply is a backup power supply is used to drive the motors (col. 3, lines 9-15; note that 'local' is a relative term). The motivation to use a backup power supply is to keep the system operating in the event of a power failure from the main power supply.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to implement into the system of Palleggi et al., a backup power supply as disclosed by Blomquist, thereby providing the advantage of allowing the motors to be operated upon main power failure, as taught by Blomquist.

With respect to claim 2-3, Palleggi et al. discloses each of the motors has a corresponding microprocessor (now DSP) and gate driver interface and a corresponding commutation module (Fig. 8, #16 has #53 and #57 and #17 has #54 and #58).

Claims 1-3, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katagiri et al. (5,619,111) in view of Blomquist (5,876,370).

With respect to claim 1, Katagiri et al. discloses a controller for controlling a plurality of motors in a system, comprising: a connector port that communicates with at least one sensor to obtain sensor data (Fig. 4, #23 receives data from e1- e6); at least one microcomputer, which is interpreted as the DSP, and gate driver interface that evaluates the sensor data and generates a control signal based on the sensor data (Fig. 4, #s 57 in each of #s 6, 7, and 8); and at least one commutation module in communication with at least one microcomputer and gate driver interface, wherein the at least one commutation module controls at least one motor based on the control signal (Fig. 4, #s 52 and 56 in each of #s 6, 7, and 8).

Katagiri et al. does not disclose the local power supply as disclosed.

Blomquist discloses a motor control system that implements a local power supply that powers the motors, and the local power supply is a backup power supply is used to drive the motors (col. 3, lines 9-15; note that 'local" is a relative term). The motivation to use a backup power supply is to keep the system operating in the event of a power failure from the main power supply. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to implement into the device of

Katagiri et al. a backup power supply that is used by the DSPs and gate drivers to drive the motors, thereby providing the advantage of allowing the system to continue driving the motors in the event of a main power failure, as taught by Blomquist.

With respect to claims 2 and 3, Katagiri et al. discloses each microcomputer (now DSP) and gate driver interface has a corresponding commutation module (Fig. 4, #57 has #52 in each of #s 6, 7, and 8).

With respect to claims 5 and 6, Katagiri et al. discloses at least one of the plurality of motors is a binary-function, variable speed motor, and wherein the at least one commutation module controls said variable speed motor (col. 4, lines 23-25,servo motors are reversible (binary) and are variable speed).

Claims 9, 10,13, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tisdale et al. (6,553,770) in view of Cox-smith et al. (6,771,032).

With respect to claim 9, Tisdale et al. discloses an integrated fluid handling system, comprising: a skid mounting a plurality of motors (col. 1, lines 14-15); a plurality of fluid-handling devices associated with said plurality of motors (Fig. 3B; water pumps 114 and 116 driven by electric motors; col. 4, lines 48-52), and said plurality of fluid-handling devices handling at least a plurality of distinct fluids (water fig. 4, 28/oil column 6, lines 2-6) for delivery to a gas turbine (column 2, line 1).

Tisdale et al. does not disclose the motor control features of claim 9.

Cox-smith et al. discloses a plurality of sensors that generate sensor data corresponding to the operation of said plurality of devices (Fig. 5, LVDT is a position sensor, and the speed and current feedback loops imply the use of a current sensor); a

multi-motor controller that controls said plurality of motors, the multi-motor controller having a connector input/output port that communicates with at least one sensor in the fluid handling system to obtain sensor data from said plurality of sensors (Fig. 1, #12 controls both motors and receives position and current feedback data); a plurality of digital signal processors (DSP) and gate driver interfaces that evaluate the sensor data from said plurality of sensors and generate a control signal based on the sensor data (Fig. 1, #12 is interpreted as the DSP, and it controls the gate drivers, #30 and 30'), and a plurality of commutation modules, each commutation module corresponding to one of said plurality of DSP and gate driver interfaces, wherein each commutation module controls at least one motor based on the control signal (Fig. 5; commutation module is #40 and #s 24, 26, and 28 based on the control signal from #34 and the speed profile). The motivation to control the motors using the control system disclosed by Cox-Smith et al. is to synchronize motor operation (col. 2, lines 38-43).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that the motors that control the pumps in Tisdale et al. could include the control features disclosed by Cox-Smith et al., thereby providing the advantage of synchronizing the motors, as taught by Cox-smith et al.

With respect to claim 10, Cox-Smith et al. discloses each motor having a corresponding DSP and gate driver interface and one commutation module (each motor, 8 and 10, have #s 24, 26, 28, and 30).

With respect to claim 13, Cox-Smith et al. at least one of the plurality of motors is a variable speed motor, and the commutation module controls at least one variable

speed motor (Fig. 5, speed profile means the motors are variable speed and #s 40, 24, 26, and 28 control the motor at different speeds).

With respect to claim 18, Tisdale et al. discloses wherein a plurality of fluids includes at least oil (column 6, lines 2-6) and water (fig. 4, 28).

With respect to claim 19, Tisdale et al. discloses wherein a plurality of fluids includes fuel. The examiner takes official notice that the gas turbine receives gas to operate.

Claims 9, 11-13, and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tisdale et al. (6,553,770) in view of Katagiri et al. (5,619,111).

With respect to claim 9, Tisdale et al. discloses an integrated fluid handling system, comprising: a skid mounting a plurality of motors (col. 1, lines 14-1 5); a plurality of fluid-handling devices associated with said plurality of motors (Fig. 3B; water pumps 114 and 116 driven by electric motors; col. 4, lines 48-52) and said plurality of fluid-handling devices handling at least a plurality of distinct fluids (water fig. 4, 28/oil column 6, lines 2-6) for delivery to a gas turbine (column 2, line 1).

Tisdale et al. does not disclose the motor control features of claim 9.

Katagiri et al disclose a system comprising: a plurality of motors (Fig. 4, M1-M6); a plurality of devices associated with the plurality of motors (Fig. 4, load attached to motors (not shown)); a plurality of sensors that generate data corresponding to the operation of the plurality of devices (Fig. 4, E1-E6); a multi-motor controller that controls the plurality of motors (Fig. 4, #9); the multi-motor controller having a connector that communicates with at least one sensor to obtain sensor data (Fig. 4, connector #23

receives sensor data e1-e6); a plurality of microcomputers, which are interpreted as DSPS, a plurality of gate driver interfaces that evaluate the sensor data and generate a control signal based on the sensor data (Fig. 4, #s 57 in #s 6, 7, and 8, respectively); and a plurality of commutation modules, each commutation module corresponding to one of the plurality of DSP and gate drivers interfaces, and where each commutation module controls at least one motor based on the control signal (Fig. 4, #s 51 and 55 in #s 6, 7, and 8, respectively). The motivation to configure the motor control system as disclosed by Katagiri et al. is to improve control reliability (col. 2, lines 32-37).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that servomotors can control the pumps in Tisdale et al., and thus, providing the advantage of improving motor control reliability, as taught by Katagiri et al.

With respect to claim 11, Katagiri et al. discloses at least one of the plurality of motors shares one DSP and gate driver interface and one motor commutation module (Fig. 4, MI and M2 share #57).

With respect to claims 12 and 13, Katagiri et al. discloses at least one of the plurality of motors is a binary-function, variable speed motor, and wherein the at least one commutation module controls said variable speed motor (col. 4, lines 23-25; servo motors are reversible (binary) and are variable speed).

With respect to claim 15, Katagiri et al. discloses the system further comprises a system controller that controls operation of the plurality of motors according to an

instruction from the multi-motor controller (Fig. 4, external setting device #26 communicates via #72 to #9: col. 4, lines 28-3 1).

With respect to claim 16, Katagiri et al. discloses the system controller is connected to the multi-motor controller via a connector selected from the group consisting of a serial connector or an Ethernet connector (Fig. 7, #72 is a serial connector that connects #26 to #9).

With respect to claim 17, Katagiri et al. discloses the system comprises a plurality of multi-motor controllers that are connected to the system controller (Fig. 7, shows a plurality of #9s ["stacked" boxes]).

With respect to claim 18, Tisdale et al. discloses wherein a plurality of fluids includes at least oil (column 6, lines 2-6) and water (fig. 4, 28).

With respect to claim 19, Tisdale et al. discloses wherein a plurality of fluids includes fuel. The examiner takes official notice that the gas turbine receives gas to operate.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tisdale et al. and Katagiri et al. as applied to claim 9 above, and further in view of Blomquist (5,876,370).

Tisdale et al. and Katagiri et al. do not disclose the limitations of claim 14.

Blomquist discloses a motor control system that implements a local power supply that powers the motors, and the local power supply is a backup power supply is used to drive the motors (col. 3, lines 9-15; note that "local" is a relative term). The motivation to

use a backup power supply is to keep the system operating in the event of a power failure from the main power supply.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to implement into the device of Tisdale et al. and Katagiri et al. a backup power supply that is used by the DSPS and gate drivers to drive the motors, thereby providing the advantage of allowing the system to continue driving the motors in the event of a main power failure, as taught by Blomquist.

Allowable Subject Matter

Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(10) Response to Argument

This is in response to the appeal brief filed 9/22/06 appealing from the Office action mailed 2/22/06.

All with respect to the rejection of **claim 1**:

The appellant's first arguments were Muira et al. is not a motor power supply. Thus, there is certainly no disclosure in Muira, et al. that would meet the limitations of the claim that there be a DSP and gate driver interface, which switches between AC power and DC power being supplied to the same motor. Simply, the references, even if properly combined, cannot meet this limitation.

Moreover, as admitted in this application, in the prior art, DC back-up power supplies were known, but were provided with a separate and distinct motor. Cho et al. would look to this type arrangement if faced with a back-up power supply problem.

The examiner disagrees, Muira discloses a back-up power source, upon failure of the normal system, the back-up system provide continues to run the control system, provide the drive circuits with command signals and driving the motors (column 2, lines 40-53). The combination is proper and the motivational statement is found in the reference. The power is switched from the normal AC power to the back-up DC to run the motor, satisfying the claimed language in its entirety.

The appellant's second arguments this rejection should be reversed for reasons almost identical to the reasons for the first rejection. Nothing within Palteggi, et al. discloses the back-up power supply. Blomquist discloses a motor control, utilizing a DC back-up power supply, however, it does not disclose the control structure wherein there is at least one DSP and gate driver interface which selects between the DC power supply, and an AC power supply, and switches between the two to supply to the same motor. Again, there is also no suggestion to combine the references. Similarly, the appellant's third argument is there was no reason to combine Katagiri et al. with Blomquist. The motivation for both can be found below.

The examiner admits Palteggi not disclosing a back-up power supply. The appellant is attacking to references solely and not in a combination as they are used.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by

combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine is to keep the system operating in the event of a power failure, Blomquist (column 3, lines 11-15).

All with respect to the rejection of **claim 9**:

The appellant's fourth arguments; Claim 9 requires specific control features for a particular type system. The examiner recognizes that Tisdale, et al. cannot meet these limitations. As one example, Tisdale et al. may well disclose a plurality of motors, however, it does not disclose the DSP and gate driver interfaces, nor the control steps of evaluating sensor data and generating a control signal, and sending the control signals to a communication module, with each communication module corresponding to one of a plurality of DSP and gate driver interfaces, and controlling at least one motor based upon the control signal.

Rather than recognizing these features are allowable, the examiner points to the Cox-Smith reference and argues this reference discloses a control which would meet the claims. However, there would be no suggestion to combine these references. Cox-Smith provides some control features to "synchronize motor operation," as alleged by the examiner. However, there is no benefit shown on this record to modify Tisdale, et al. such that its several motors are "synchronized." The motors all are operating

independently of each other, and there would be no proper reason to combine the references. The combination is not suggested.

The examiner respectfully disagrees, in the 103 rejection, all parts of the system are pointed out in their entirety and contains a proper motivation for combination. Again the appellant is attacking the references individually, not as a combination as the rejection is stated. The motor control system of Cox-Smith would provide the advantage of synchronizing the motors of Tisdale, as taught by Cox-Smith (column 2, lines 38-43).

The appellant's fifth arguments; the examiner recognizes the deficiencies in Tisdale, et al. However, the examiner argues that Katagiri, et al. would meet the limitations of the claims, and to supply a motor control system as disclosed by Katagiri, et al. would improve "control liability" in the Tisdale, et al. device. However, there is no true suggestion to combine these references. Again, Tisdale, et al. includes a complex system, and has its own controls. There is nothing within Katagiri, et al. that would suggest the proposed modification. Simply, this combination is based only upon hindsight reconstruction.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a

reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). The motivation to configure the motor control system as disclosed by Katagiri et al is to improve control reliability (column 2, lines 32-37).

All with respect to the rejection of **claim 14**:

The appellant's sixth arguments; Claim 14 is dependent to claim 9 and adds in the feature that there is a local DC power supply that acts as a back-up power supply to power the plurality of motors, and wherein the plurality of DSP and gate driver switch to the DC back-up power supply to power the motor in the event of a main power line failure.

The examiner attempts to reject these claims over Blomquist et al., added to the claim 9 combinations. Again, Blomquist does not meet the claims for the reasons mentioned above. Moreover, there is no suggestion to modify Tisdale, et al. with this teaching. Tisdale, et al. does not disclose any features which would benefit from anything arguably disclosed in Blomquist.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to

combine is to keep the system operating in the event of a power failure, Blomquist (column 3, lines 11-15).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

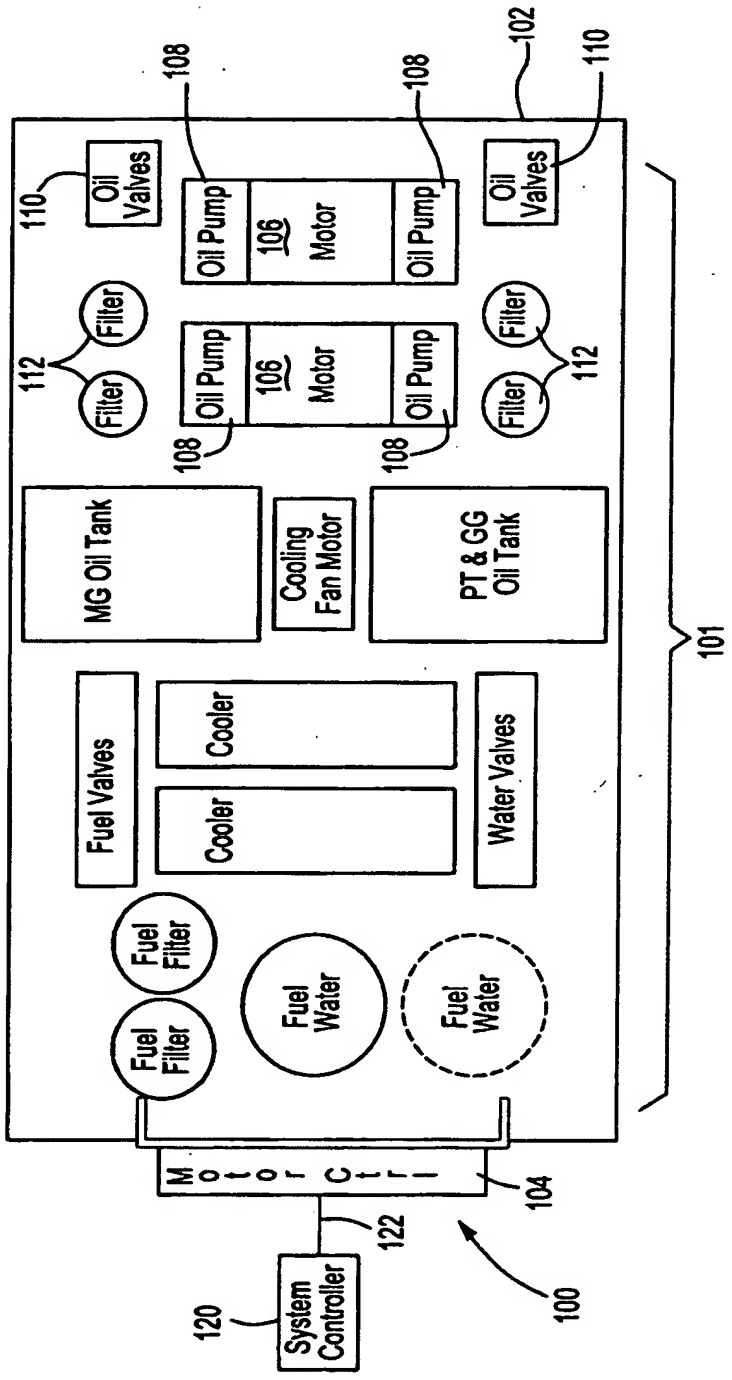
Erick Glass 12/23/04

Conferees:

David Blum

Lincoln Donovan

LINCOLN DONOVAN
SUPERVISORY PATENT EXAMINER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101
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System Controller
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Fig-1

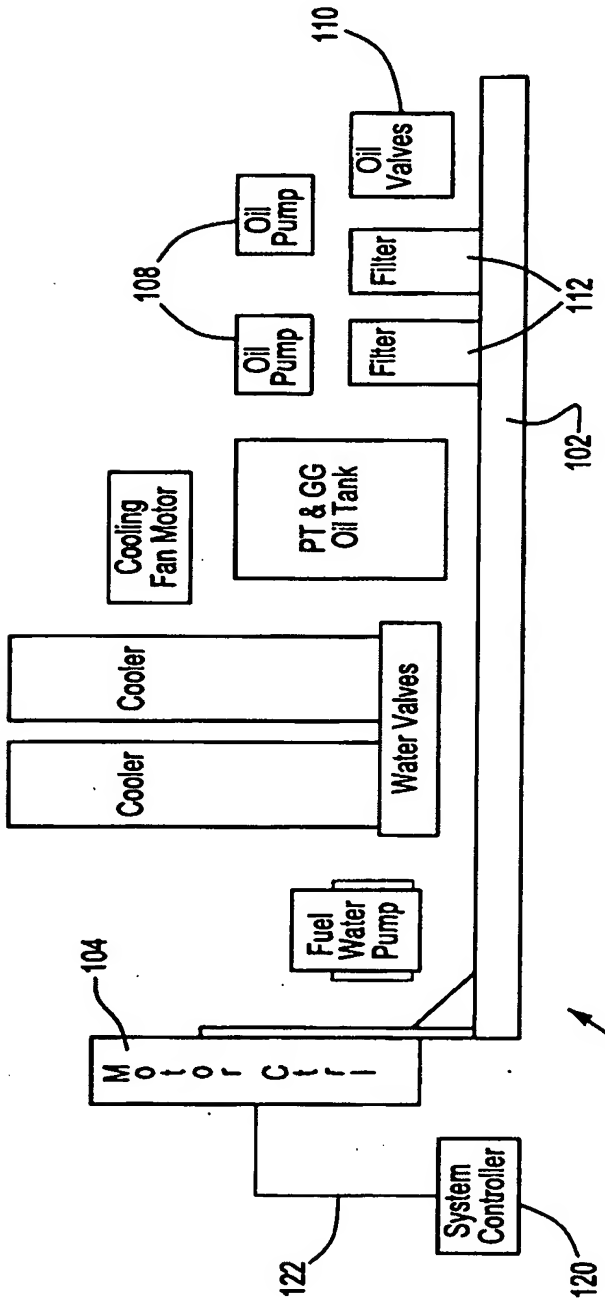
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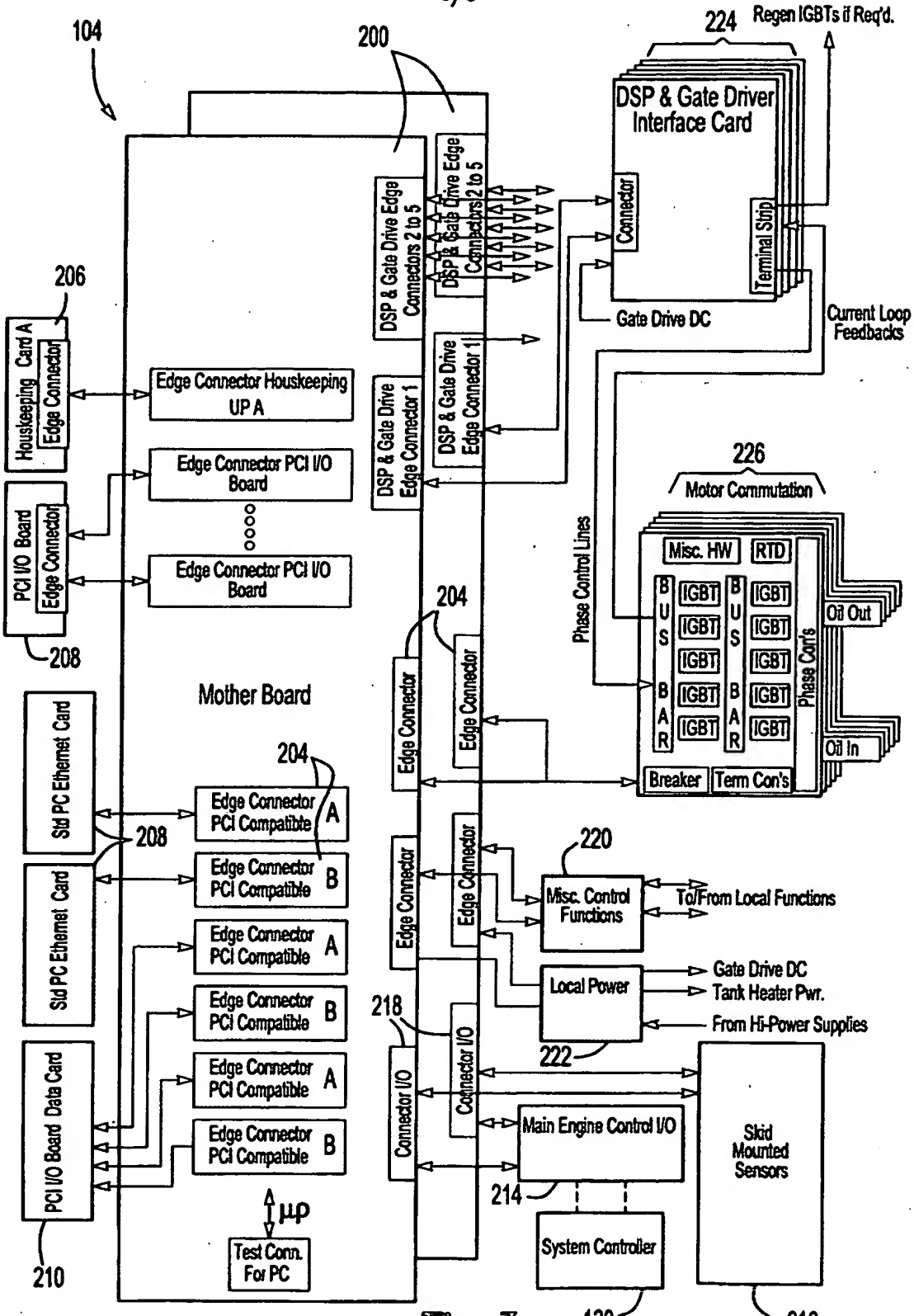
Fig-2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Housekeeping Card A
Edge Connector
Edge Connector Housekeeping UP A
DSP & Gate Drive Edge Connector 1
DSP & Gate Drive Edge Connector 1
Gate Drive DC
Current Loop Feedbacks
Edge Connector PCI I/O Board
PCI I/O Board
Edge Connector
Edge Connector PCI I/O Board
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Motor Commutation
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RTD
Phase Control Lines
BUS BAR
IGBT
Oil Out
Oil In
Phase Con's
Breaker
Term Con's
204
Mother Board
Edge Connector
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Edge Connector PCI Compatible A
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Edge Connector PCI Compatible A
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220
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To/From Local Functions
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Local Power
Gate Drive DC
Tank Heater Pwr.
From Hi-Power Supplies
218
222
Connector I/O
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PCI I/O Board Data Card
Edge Connector PCI Compatible A
Edge Connector PCI Compatible B
Main Engine Control I/O
Skid Mounted Sensors
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μp
Test Conn. For PC
System Controller
210
120
216

Fig-3